

REMARKS**Summary of the Office Action**

Claim 1-15 and 26-40 stand rejected under 35 U.S.C. §102(b) as being anticipated by or, in the alternative, under 35 U.S.C. §103(a) as being obvious over Bamberger (US 6,023,322), claims 16-25 stand rejected under 35 U.S.C. under 35 U.S.C. §103(a) as being unpatentable over Bamberger in view of Nishino et al. (US 5,724,141), claim 43 stands rejected under 35 U.S.C. §102(b) as being anticipated by Burns (US 5,953,110) or Endo (US 4,477,184), and claims 44 and 45 stand rejected under 35 U.S.C. §103(a) as being unpatentable in view of Burns or Endo.

Claims 1-45 stand rejected under 35 U.S.C. § 112, first and second paragraphs.

The specification is objected to under 35 U.S.C. § 112, first paragraph.

The drawings are objected to under 37 CFR 1.83.

Summary of Response to the Office Action

Applicants have not amended any claims. Accordingly, claims 1-45 are presently pending.

Applicants concurrently file herewith a Submission of Replacement Drawings.

Objection to the Drawings

The drawings are objected to under 37 CFR 1.83. Accordingly, Applicants submit concurrently herewith a Submission of Replacement Drawings including amendments to FIGs. 2 and 10. Accordingly, Applicants respectfully submit that the drawings comply with 37 CFR 1.83, and respectfully request that the objection to the drawings be withdrawn.

Objection to the Specification

The specification is objected to under 35 U.S.C. § 112, first paragraph, for allegedly using the term “frequency” improperly. Specifically, the Office Action alleges that “[t]he present claims and disclosure appear to improperly use the term ‘frequency’ for --recurrences-- since there is no recurring regular signal per unit time ever measured.” Applicants respectfully disagree.

As instructed in MPEP 2173.05(a) “when there is more than one definition for a term, it is incumbent upon applicant to make clear which definition is being relied upon to claim the invention.” Accordingly, Applicants respectfully submit that use of the term “frequency,” as consistently used throughout the specification and claims, refers to the number of times a specified phenomenon takes place within a specified interval, and not to modulation of electromagnetic radiation, i.e., hertz. Thus, Applicants respectfully assert that use of the term “frequency” complies with the requirements of 35 U.S.C. § 112, first paragraph, and respectfully requests that the objection to the specification under 35 U.S.C. § 112, first paragraph, be withdrawn.

All Claims Comply with 35 U.S.C. § 112

Claims 1-45 stand rejected under 35 U.S.C. § 112, first and second paragraphs, for allegedly failing to describe the claimed invention “in such full, clear, concise and exact terms as to enable any person skilled in the art to make and use the same, and/or for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.” Specifically, the Office Action alleges that “[t]he present claims and disclosure appear to improperly use the term ‘frequency’ for --recurrences--since there is no recurring regular signal

per unit time ever measured.” In addition, the Office Action alleges that “what is measured is the recurrence of range hits in a stacking memory.” Applicants respectfully disagree.

As instructed in MPEP 2173.01,

“[a] fundamental principle contained in 35 U.S.C. 112, second paragraph is that applicants are their own lexicographers. They can define in the claims what they regard as their invention essentially in whatever terms they choose so long as the terms are not used in ways that are contrary to accepted meanings in the art.”

Moreover, as instructed in MPEP 2173.01,

“a claim may not be rejected solely because of the type of language used to define the subject matter for which patent protection is sought.”

Accordingly, Applicants respectfully submit that use of the term “frequency,” as consistently used throughout the specification and claims, refers to the number of times a specified phenomenon takes place within a specified interval, and not to modulation of electromagnetic radiation, i.e., hertz. Moreover, Applicants respectfully assert that use of the term “frequency” throughout the specification and claims is not repugnant to the well known common use of the term. Thus, Applicants respectfully assert that claims 1-45 comply with the requirements of 35 U.S.C. § 112, first and second paragraphs, since use of the term “frequency” is clearly defined in Applicants’ specification and is not repugnant to the well known common use of the term.

Therefore, Applicants respectfully request that the rejections under 35 U.S.C. § 112, first and second paragraphs, be withdrawn.

All Claims Define Allowable Subject Matter

Claim 1-15 and 26-40 stand rejected under 35 U.S.C. §102(b) as being anticipated by or, in the alternative, under 35 U.S.C. §103(a) as being obvious over Bamberger (US 6,023,322), claims 16-25 stand rejected under 35 U.S.C. under 35 U.S.C. §103(a) as being unpatentable over Bamberger in view of Nishino et al. (US 5,724,141), claim 43 stands rejected under 35 U.S.C. §102(b) as being anticipated by Burns (US 5,953,110) or Endo (US 4,477,184), and claims 44 and 45 stand rejected under 35 U.S.C. §103(a) as being unpatentable in view of Burns or Endo. Applicants respectfully traverse these rejections for at least the following reasons.

In contrast to Applicants' claimed invention, Bamberger teaches (col. 2, lines 40-44) determining a distance to a target by averaging individual distances determined by pulses received by a measuring apparatus, wherein a microcontroller 21 having a pulse stack memory 43 and comparator detects and identifies valid pulse returns and the number of pulse returns, either as an absolute number or as a ratio of returned transmitted pulses to provide output to a target quality indicator. In further contrast to Applicants' claimed invention, Bamberger teaches (col. 6, lines 13-20) that the pulse stack memory 43 stores pulse amplitudes and durations, compares each subsequent pulse with all of the stored pulses to determine a match, wherein any pulses that match are considered to be valid pulses and subsequent pulses can then be compared against the matches pulses. Thus, Applicants respectfully submit that Bamberger is completely silent with respect to determining a distance to a target by making use of amplitude and durations of transmitted pulse signals.

According to the present invention, a ranging apparatus includes "a table production component for producing a frequency distribution table corresponding to elapsed time by adding

up the above-mentioned frequencies with respect to the above-mentioned measurement light repeatedly emitted a specific number of times,” “a distance determiner for determining as the distance to the above-mentioned object of measurement the elapsed time, converted to distance, at which the total count in the above-mentioned frequency distribution table exceeds a specific threshold,” and “a distance selector for selecting (a) specific distance(s) from among a plurality of distances when the above-mentioned distance determiner determines a plurality of distances to the above-mentioned object of measurement,” as recited by independent claim 1.

Accordingly, Applicants respectfully submit that it is not the average of the distances determined by the received pulses, but the distance which the frequency thereof exceeds a specific threshold that are selected as the output distance. Thus, distances may be measured with higher accuracy using the apparatus and methods of Applicants’ invention than the “averaging” method taught by Bamberger.

Applicants respectfully submit that the claimed “frequency distribution table,” as recited by independent claims 1, 2, 14-16, 18, 21, 23, 26, 28, 30, 32, 34, 35, 39, 40, and 43, operates completely different from the stack pulse memory taught by Bamberger. According to the “table” recited by independent claims 1, 2, 14-16, 18, 21, 23, 26, 28, 30, 32, 34, 35, 39, 40, and 43, a total count in the frequency distribution table may exceed the plurality of points that correspond to different distances to the target. For example, according to the present invention, when the total count in the frequency distribution table exceeds the plurality of points, the distance selector selects a specific distance, or distances among the plurality of distances. Applicants respectfully assert that the stack pulse memory taught by Bamberger is not capable of performing this function since Bamberger teaches determining a distance to a target by averaging

individual distances determined by pulses received by a measuring apparatus to provide an output.

Applicants further assert that the Office Action does not rely on Nishio to remedy the deficiencies of Bamberger. Moreover, Applicants respectfully assert that Nishio cannot remedy the deficiencies of Bamberger.

Independent claim 43 recites an opto-electric conversion circuit including “a reverse bias voltage setting component for adjusting the reverse bias voltage applied to the above-mentioned avalanche photodiode during opto-electric conversion to a voltage obtained by multiplying the above-mentioned detected reference reverse bias voltage by a specific ratio.” In contrast to Applicants’ claimed invention, neither Burns nor Endo teaches or suggests “a reverse bias voltage setting component for adjusting the reverse bias voltage applied to the above-mentioned avalanche photodiode during opto-electric conversion to a voltage obtained by multiplying the above-mentioned detected reference reverse bias voltage by a specific ratio,” as recited by independent claim 43, and hence dependent claims 44 and 45. For example, Burns is completely silent with respect to “a reverse bias voltage setting component,” as recited by independent claim 43, and Endo is completely silent with respect to “adjusting the reverse bias voltage applied to the above-mentioned avalanche photodiode during opto-electric conversion to a voltage obtained by multiplying the above-mentioned detected reference reverse bias voltage by a specific ratio,” as recited by independent claim 43.

MPEP §2131 instructs that “[t]o anticipate a claim, the reference must teach every element of the claim.” Thus, “[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.

Verdegaal Bros. v. Union Oil Co. of California, 2 USPQ 2d 1051, 1053 (Fed. Cir. 1987).

Moreover, MPEP §2143.03 instructs that “[t]o establish a prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 4980 F.2d 981, 180 USPQ 580 (CCPA 1974).”

Accordingly, Applicants respectfully submit that since neither Bamberger, Nishio, Burns, nor Endo, whether taken singly or combined, teach or suggest every feature of at least independent claims 1, 2, 14-16, 18, 21, 23, 26, 28, 30, 32, 34, 35, 39, and 40, neither Bamberger, Nishio, Burns, nor Endo anticipates or make obvious claims 1-45. Thus, Applicants respectfully request that the rejections of claims 1-45 in view of Bamberger, Nishio, Burns, and/or Endo should be withdrawn.

CONCLUSION


In view of the foregoing remarks, Applicants respectfully request reconsideration of this application, withdrawal of all rejections, and the timely allowance of all pending claims. Should the Examiner feel that there are any issues outstanding after consideration of this response, the Examiner is invited to contact Applicants’ undersigned representative to expedite prosecution.

If there are any other fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-0310. If a fee is required for an extension of time under

37 C.F.R. § 1.136 not accounted for above, such an extension is requested and the fee should also be charged to our Deposit Account.

Respectfully Submitted,

MORGAN, LEWIS & BOCKIUS LLP

By: 
David B. Hardy
Reg. No. 47,362

Dated: May 27, 2004

Customer No. 09629

MORGAN, LEWIS & BOCKIUS LLP

1111 Pennsylvania Avenue, N.W.

Washington, D.C. 20004

Telephone: (202) 739-3000

Facsimile: (202) 739-3001